Design and Control of the MESUR/Pathfinder Microrover

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1 he use of unmanned robotic vehicles to assist in the exploration of Mars and other planets has been of interest to the National Aeronautics and Space Administration (NASA) for several decades and has been the focus of an ongoing research program at the Jet Propulsion Laboratory (JPL) for a similar period of time. As a result of these research activities, JPL is in the process of designing and building a small (7-9 Kg) microrover to be flown aboard the MESUR/Pathfinder [1] spacecraft which is tentatively due to be launched to Mars in November of 1996. The lander portion of the spacecraft, which contains the microrover, is scheduled to reach the surface of Mars in late 1997. The microrover will perform a variety of technology experiments designed to provide information critical to the design of future planetary rovers. In addition, the microrover will perform several science and lander related experiments using specialized on board instruments, To enable the microrover to perform these experiments at selected target areas and at the same time deal with the long time delays (and limited communications bandwidth), a control/navigation approach combining the use of operator designated waypoints and onboard behavior control has been adopted. The design of the MESUR/F)athfinder microrover and the overall manner in which it is controlled are described herein.

[1] Mars--Environmental SURvey Mission (MESUR)